AMENDMENTS TO THE CLAIMS:

Listing of the claims:

This listing of the claims will replace all prior versions, and listing, of the claims in the application:

1. – 10. (Canceled)

11. (Previously Presented) A composition for impairing a hematologic cancer progenitor cell that expresses CD123, but does not significantly express CD131, the composition comprising a therapeutically effective amount of an antibody and a cytotoxic agent, wherein the composition binds selectively to CD123.

12. (Previously Presented) The composition of claim 11, wherein the cytotoxic agent is a chemotherapeutic agent.

13. (Previously Presented) The composition of claim 11, wherein the cytotoxic agent is a plant-derived, fungus-derived or bacteria-derived toxin.

14. (Previously Presented) The composition of claim 11, wherein the cytotoxic agent is a radioisotope.

15. (Previously Presented) The composition of claim 14, wherein the radioisotope is an alpha-emitting radioisotope.

16. (Currently Amended) An assay for detecting the presence of hematologic cancer progenitor cell that expresses CD123, but does not significantly express CD131 in a sample, the assay comprising contacting the sample with an antibody that binds selectively to CD123, and detecting the binding of the antibody to a cell in the sample.

17. (Previously Presented) The assay of claim 16, wherein the antibody is labeled with a detectable label.

18. (Previously Presented) The composition of claim 11, wherein the hematologic cancer progenitor cell is a leukemic or malignant lymphoproliferative cell.

19. (Currently Amended) The composition of claim 18, wherein the leukemic cell is selected from the group consisting of an acute myelogenous leukemic cell, a chronic

myelogenous leukemic cell, an acute lymphocytic leukemic cell, ~~and~~ a chronic leukemic cell and a leukemic cell from myelodysplastic syndrome.

20. (Previously Presented) The composition of claim 18, wherein the malignant lymphoproliferative cell is a lymphoma cell.

21. (Previously Presented) The composition of claim 11, wherein the hematologic cancer progenitor cell is selected from the group consisting of a multiple myeloma cell, a non-Hodgkin's lymphoma cell, a Burkitt's lymphoma cell, and a follicular lymphoma cell (small cell and large cell).

22. (Currently Amended) A method for purging hematologic cancer progenitor cells that express CD123, but do not significantly express CD131, comprising, contacting bone marrow or peripheral blood with a composition comprising an antibody and a cytotoxic agent, wherein said composition binds selectively to CD123.

23. (Previously Presented) A method for impairing cancerous progenitor cells, which express CD123, but do not significantly express CD131, in a patient in need thereof, comprising introducing to the patient's bone marrow or peripheral blood a composition comprising an antibody and a cytotoxic agent, wherein said composition binds selectively to CD123.

24. (Previously Presented) A method of purging cancerous progenitor cells that express CD123, but do not significantly express CD131 in a patient in need thereof, comprising:

(a) introducing to a sample from the patient a composition comprising an antibody that binds selectively to CD123 to permit binding of the antibody to cancerous progenitor cells in the sample that express CD123, but do not significantly express CD131; and

(b) removing antibody-bound cancerous progenitor cells.

25. (Previously Presented) The method according to claim 24, wherein the sample is a bone marrow sample.

26. (Previously Presented) The method according to claim 24, wherein the sample is a peripheral blood sample.

27. (Previously Presented) The composition of claim 11, wherein the hematologic cancer progenitor cell does not significantly express CD131 as examined by flow cytometry.

28. (Previously Presented) The composition of claim 11, wherein the antibody is conjugated to the cytotoxic agent.

29. (Previously Presented) The composition of claim 28, wherein the cytotoxic agent is a chemotherapeutic agent.

30. (Previously Presented) The composition of claim 28, wherein the cytotoxic agent is a plant-derived, fungus-derived or bacteria-derived toxin.

31. (Previously Presented) The composition of claim 28, wherein the cytotoxic agent is a radioisotope.

32. (Previously Presented) The composition of claim 31, wherein the radioisotope is an alpha-emitting radioisotope.

33. (Previously Presented) The composition of claim 28, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

34. (Previously Presented) The composition of claim 30, wherein the bacteria-derived toxin is a deglycosylated ricin A chain, a ribosome inactivating protein, alpha-sarcin, aspergillin, restrictocin, a ribonuclease, diphtheria toxin or *Pseudomonas* exotoxin.

35. (Previously Presented) The composition of claim 32, wherein the alpha-emitting radioisotope is ^{211}astatine, ^{212}bismuth, or ^{213}bismuth.

36. (Previously Presented) The composition of claim 31, wherein the radioisotope is a beta-emitting radioisotope.

37. (Previously Presented) The composition of claim 36, wherein the beta-emitting radioisotope is ^{131}iodine, ^{90}yttrium, ^{177}lutetium, ^{153}samarium or ^{109}palladium.

38. (Previously Presented) The composition of claim 28, wherein the cytotoxic agent is a hormone, an antimetabolite, an alkylating agent, a coagulant, a cytokine, a growth factor, a bacterial endotoxin, the lipid A moiety of a bacterial endotoxin or a cytotoxin.

39. (Previously Presented) The composition of claim 29, wherein the chemotherapeutic agent is a steroid, cytosine arabinoside, fluorouracil, methotrexate, aminopterin, an anthracycline, mitomycin C, a vinca alkaloid, demecolcine, etoposide, mithramycin, calicheamicin, CC-1065, chlorambucil or melphalan.

40. (Previously Presented) The composition of claim 13, wherein the bacteria-derived toxin is a deglycosylated ricin A chain, a ribosome inactivating protein, alpha-sarcin, aspergillin, restrictocin, a ribonuclease, diphtheria toxin or *Pseudomonas* exotoxin.

41. (Previously Presented) The composition of claim 15, wherein the alpha-emitting radioisotope is ^{211}astatine, ^{212}bismuth, or ^{213}bismuth.

42. (Previously Presented) The composition of claim 14, wherein the radioisotope is a beta-emitting radioisotope.

43. (Previously Presented) The composition of claim 42, wherein the beta-emitting radioisotope is ^{131}iodine, ^{90}yttrium, ^{177}lutetium, ^{153}samarium or ^{109}palladium.

44. (Previously Presented) The composition of claim 11, wherein the cytotoxic agent is a hormone, an antimetabolite, an alkylating agent, a coagulant, a cytokine, a growth factor, a bacterial endotoxin, the lipid A moiety of a bacterial endotoxin or a cytotoxin.

45. (Previously Presented) The composition of claim 12, wherein the chemotherapeutic agent is a steroid, cytosine arabinoside, fluorouracil, methotrexate, aminopterin, an anthracycline, mitomycin C, a vinca alkaloid, demecolcine, etoposide, mithramycin, calicheamicin, CC-1065, chlorambucil or melphalan.

46. (Previously Presented) The assay of claim 16, wherein the hematologic cancer progenitor cells do not significantly express CD131 as examined by flow cytometry.

47. (Previously Presented) The assay of claim 16, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

48. (Previously Presented) The assay of claim 16, wherein the sample is urine, saliva, cerebrospinal fluid, blood, serum, bone marrow or feces.

49. (Previously Presented) The method of claim 22, wherein the hematologic cancer cells do not significantly express CD131 as examined by flow cytometry.

50. (Previously Presented) The method of claim 22, wherein the hematologic cancer cells are hematologic cancer progenitor cells.

51. (Previously Presented) The method of claim 22, wherein the antibody is conjugated to the cytotoxic agent.

52. (Previously Presented) The method of claim 22, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

53. (Previously Presented) The method of claim 22, wherein the cytotoxic agent is a chemotherapeutic agent, a plant-derived toxin, a fungus-derived toxin, a bacteria-derived toxin or a radioisotope.

54. (Previously Presented) The method of claim 53, wherein the bacteria-derived toxin is a deglycosylated ricin A chain, a ribosome inactivating protein, alpha-sarcin, aspergillin, restrictocin, a ribonuclease, diphtheria toxin or *Pseudomonas* exotoxin.

55. (Previously Presented) The method of claim 22, wherein the cytotoxic agent is a hormone, an antimetabolite, an alkylating agent, a coagulant, a cytokine, a growth factor, a bacterial endotoxin, the lipid A moiety of a bacterial endotoxin or a cytotoxin.

56. (Previously Presented) The method of claim 53, wherein the chemotherapeutic agent is a steroid, cytosine, arabinoside, fluorouracil, methotrexate, aminopterin, an anthracycline, mitomycin C, a vinca alkaloid, demecolcine, etoposide, mithramycin, calicheamicin, CC-1065, chlorambucil or melphalan.

57. (Previously Presented) The method of claim 53, wherein the radioisotope is an alpha-emitting radioisotope or a beta-emitting radioisotope.

58. (Previously Presented) The method of claim 23, wherein the cancerous progenitor cells do not significantly express CD131 as examined by flow cytometry.

59. (Previously Presented) The method of claim 23, wherein the antibody is conjugated to the cytotoxic agent.

60. (Previously Presented) The method of claim 23, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

61. (Previously Presented) The method of claim 23, wherein the cytotoxic agent is a chemotherapeutic agent, a plant-derived toxin, a fungus-derived toxin, a bacteria-derived toxin or a radioisotope.

62. (Previously Presented) The method of claim 61, wherein the bacteria-derived toxin is a deglycosylated ricin A chain, a ribosome inactivating protein, alpha-sarcin, aspergillin, restrictocin, a ribonuclease, diphtheria toxin or *Pseudomonas* exotoxin.

63. (Previously Presented) The method of claim 23, wherein the cytotoxic agent is a hormone, an antimetabolite, an alkylating agent, a coagulant, a cytokine, a growth factor, a bacterial endotoxin, the lipid A moiety of a bacterial endotoxin or a cytotoxin.

64. (Previously Presented) The method of claim 61, wherein the chemotherapeutic agent is a steroid, cytosine, arabinoside, fluorouracil, methotrexate, aminopterin, an anthracycline, mitomycin C, a vinca alkaloid, demecolcine, etoposide, mithramycin, calicheamicin, CC-1065, chlorambucil or melphalan.

65. (Previously Presented) The method of claim 61, wherein the radioisotope is an alpha-emitting radioisotope or a beta-emitting radioisotope.

66. (Previously Presented) The method of claim 23, wherein the patient is human.

67. (Previously Presented) The method of claim 24, wherein the cancerous progenitor cells do not significantly express CD131 as examined by flow cytometry.

68. (Previously Presented) The method of claim 24, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

69. (Previously Presented) The method of claim 24, wherein the patient is human.

70. (Previously Presented) The composition of claim 11, wherein the hematologic cancer progenitor cell is a cell from myelodysplastic syndrome.

71. (Previously Presented) A composition for impairing a hematologic cancer progenitor cell that expresses CD123, but does not express CD131 as examined by flow cytometry, the composition comprising a therapeutically effective amount of a conjugate, wherein the conjugate comprises a cytotoxic agent and an antibody that binds to CD123.

72. (Previously Presented) A method for impairing cancerous progenitor cells, which express CD123, but do not express CD131 as examined by flow cytometry, in a patient in need thereof, comprising introducing to the patient's bone marrow or peripheral blood a composition comprising a conjugate, wherein the conjugate comprises a cytotoxic agent and an antibody that binds to CD123.

73. (Previously Presented) A method for purging hematologic cancer progenitor cells that express CD123, but do not express CD131 as examined by flow cytometry, comprising contacting bone marrow or peripheral blood with a conjugate comprising a cytotoxic agent and an antibody that binds to CD123.

74. (Previously Presented) A method of purging cancerous progenitor cells, which express CD123, but do not express CD131 as examined by flow cytometry, in a patient in need thereof, comprising:

(a) introducing to a sample from the patient a composition comprising an antibody that binds selectively to CD123 to permit binding of the antibody to cancerous progenitor cells in the sample that express CD123, but do not express CD131 as examined by flow cytometry; and

(b) removing antibody-bound cancerous progenitor cells.

75. (Previously Presented) The composition of claim 71, wherein the antibody selectively binds to CD123.

76. (Previously Presented) The method of claim 72, wherein the antibody selectively binds to CD123.

77. (Previously Presented) The method of claim 73, wherein the antibody selectively binds to CD123.

78. (Previously Presented) The method of claim 74, wherein the antibody selectively binds to CD123.

79. (Previously Presented) A method for treating a hematologic cancer, comprising administering to a patient in need thereof the composition of claim 71.

80. (Previously Presented) The method of claim 79, wherein the patient is a human.

81. (Previously Presented) The method of claim 79, wherein the hematologic cancer is an acute myelogenous leukemia, a chronic myelogenous leukemia, an acute lymphoid leukemia, a chronic leukemia, or myelodysplastic syndrome.

82. (Previously Presented) The method of claim 79, wherein the hematologic cancer is a multiple myeloma, a non-Hodgkin's lymphoma, a Burkitt's lymphoma, or a follicular lymphoma (small cell and large cell).

83. (Previously Presented) The method of claim 79, wherein the antibody selectively binds to CD123.

84. (Previously Presented) The method of claim 79, wherein the cytotoxic agent is a chemotherapeutic agent, a plant-derived toxin, a fungus-derived toxin, a bacteria-derived toxin or a radioisotope.

85. (Previously Presented) The method of claim 84, wherein the bacteria-derived toxin is a deglycosylated ricin A chain, a ribosome inactivating protein, alpha-sarcin, aspergillin, restrictocin, a ribonuclease, diphtheria toxin or *Pseudomonas* exotoxin.

86. (Previously Presented) The method of claim 79, wherein the cytotoxic agent is a hormone, an antimetabolite, an alkylating agent, a coagulant, a cytokine, a growth factor, a bacterial endotoxin, the lipid A moiety of a bacterial endotoxin or a cytotoxin.

87. (Previously Presented) The method of claim 84, wherein the chemotherapeutic agent is a steroid, cytosine, arabinoside, fluorouracil, methotrexate, aminopterin, an anthracycline, mitomycin C, a vinca alkaloid, demecolcine, etoposide, mithramycin, calicheamicin, CC-1065, chlorambucil or melphalan.

88. (Previously Presented) The method of claim 84, wherein the radioisotope is an alpha-emitting radioisotope or a beta-emitting radioisotope.

89. (Previously Presented) The composition of claim 11, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

90. (New) The composition of claim 71, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

91. (New) The method of claim 72, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.

92. (New) The method of claim 73, wherein the antibody is a monoclonal antibody, $F(ab')_2$, Fab or Fv.